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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:  
 NEUMANN

Serial No.: 08/871,004

Filing Date: June 6, 1997

Attorney Docket No.: NEU-101

Title: CAPSICUM BASED  
 INSECTICIDE  
 AND METHOD OF USE  
 (once amended)

**DECLARATION OF JEFFREY Y. HONDA, Ph.D.**

Examiner: Lavinder, J.

Group Art Unit: 3616

**RECEIVED**

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Commissioner of Patents and Trademarks  
 Washington, D.C. 20231

**DECLARATION OF JEFFREY Y. HONDA, Ph.D.**

1. Jeffrey Y. Honda, do hereby declare under penalty of perjury:

1. The following is true and accurate, and that this declaration is based on my own personal knowledge and on information and belief.
2. I make this Declaration in support of Applicant Robert Neumann's Application for Letters Patent entitled CAPSICUM BASED PESTICIDE AND METHOD OF USE.
3. I am an Assistant Professor at San Jose State University in the Department of Biological

Declaration of Jeffrey Y. Honda, Ph.D.

Title: CAPSICUM BASED INSECTICIDE AND METHOD OF USE

Page 1 of 3

Serial No.: 08/871,004  
 Attorney Docket No.: NEU-101


Sciences, One Washington Square, San Jose, California 95192-0100, Tel: (408) 924-4877, Fax: (408) 924-4840.

4. A true and accurate copy of my current Curriculum Vitae is attached hereto. I hold a Ph.D. degree in the field of Entomology and have over ten years of professional experience. I have taught and done research at numerous nationally and internationally accredited institutions of higher learning. I have received recognition for my academic achievements both here in the United States as well as internationally.
5. Neither I nor San Jose State University are an agent, employee, partner nor representative in any capacity of the Applicant. Neither I nor San Jose State University have any financial, pecuniary nor other interest, either vested or unvested, in the present Application. I have known only known of Mr. Neumann since about February 3, 1999 and have only known Mr. Neumann personally since about February 18, 1999.
6. On February 18, 1999 I performed a scientific study to determine whether the active ingredients in "Habanero" chile peppers (assumed to be capsicum) has the ability to kill termites. It is my conclusion that "Habanero" pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment.
7. The Objective, Methods, Results and Conclusions of my study are contained in a document which I wrote entitled "The Use of Pepper Extract as a Possible Mortality Agent against Termites" which is also attached hereto. The documents describe a study using two different species of termites, namely subterranean and drywood termites. No variations in the concentration of pepper spray were made with regard to the non-control methods.
8. Based on my experiments, I conclude that the pepper extract, at least at the tested

concentration, is significantly associated with subterranean termite mortality. There is only a 0.5% probability that my results were due to chance alone. I conclude that "Habanero" pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment.

9. Although drywood termite mortality was observed when exposed to pepper extract, the results were not statistically significant and inconclusive. I cannot state with statistical confidence that pepper extract kills drywood termites.
10. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Section 1001, and that such willful statements may jeopardize the validity of the application or any patent issued thereon.

Declarant:

  
Jeffrey Y. Honda, Ph.D.Date: February 22, 1999

**CURRICULUM VITAE****JEFFREY Y HONDA**

3089 Teal Ridge Ct.  
San Jose, CA. 95138  
408-269-4309

---

**EDUCATION**

University of California  
*Ph.D. in Entomology*

Riverside, CA  
1995

University of California  
*M.S. in Entomology*

Riverside, CA  
1990

San Jose State University  
*B.S. in Biological Sciences*  
*Concentration Entomology*

San Jose, CA  
1987

**PROFESSIONAL EMPLOYMENT**

San Jose State University  
*Assistant Professor*

San Jose, CA.  
August 1998- Present

Kyushu University  
*Research Fellow*

Fukuoka, Japan  
June 1997-June 1998

San Jose State University  
*Assistant Professor*  
(Temporary Faculty Assignment)

San Jose, CA  
January 1996-May 1997  
January 1997-May 1997

Wageningen Agricultural University  
*Research Associate*

Wageningen, The Netherlands  
August 1995-January 1996  
July 1996-January 1997

University of California  
*Research Associate*

Riverside, CA  
February 1995- August 1995

University of California  
*Research and Teaching Assistant*

Riverside, CA  
September 1988-February 1995

Jeffrey Y Honda

Page 2

Moreno Valley Unified School District  
 Substitute Teacher

Moreno Valley, CA  
 1992

Santa Clara County Department of Food and Agriculture  
 Inspector

San Jose, CA  
 1988

Laboratory Services  
 Assistant Laboratory Technician

San Jose, CA  
 1984 to 1988

California Department of Food and Agriculture  
 Inspector

Campbell, CA  
 1986

### PUBLICATIONS

#### Proceedings and Unrefered Articles:

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• Proceedings of Experimental and Applied Entomology. N.E.V. Amsterdam, Volume 8. 15-20

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Jeffrey Y Honda

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- Annals of the Entomological Society of America. 88(4): 227-236.

#### PROFESSIONAL ORGANIZATIONS

Sigma Xi

- 1991-present

Gamma Sigma Delta

- 1994-present

Pan-Pacific Entomological Society

- 1993-present

Entomological Society of America

- 1990-present

#### AWARDS AND FELLOWSHIPS

Japan Society for the Promotion of Science

Kyushu University. 1997

Harry Scott Smith Award for Outstanding Biological Control Student  
University of California, Riverside. 1994

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P. 8

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P. 8

**The Use of Pepper Extract as a Possible Mortality Agent against Termites**  
**Jeffrey Y. Honda, Ph.D.**  
**February 19, 1999**

## Objective

To determine whether the active ingredients in 'Habenero' peppers (assumed to be capsicum) have the ability to kill termites.

## Methods

### 'Habenero' Pepper Solution

Ten medium sized 'Habenero' peppers were finally chopped and allowed to soak for three hours in 600 ml. of purified water. The solution was then filtered into a spray bottle for experiments.

### Termites

2 termite species, commonly known as drywood and subterranean termites, were collected in the field. Twenty-five drywood termites were divided into two groups: one which contained 14 termites and one which contained 11 termites. Each group of termites was placed in a 9 cm. diameter petri dish containing moistened filter paper. The first group containing 14 termites was subjected to three bursts from the spray bottle containing the pepper extract. The second group consisting of 11 drywood termites was subjected to three bursts from a spray bottle containing water only which served as a control. The same experimental design was used for subterranean termites except the treatment and control groups contained 14 and 13 termites, respectively.

Termites were maintained in their respective petri dishes for 24 hrs. after which counts were made to determine the number of termites surviving for each group.

Significant differences in survivorship were compared for each species using a  $\chi^2$  test of independence.



## Results

Data for drywood termites are shown below. Three of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water controlled died in this period. Based on the statistics below, pepper extract does not kill drywood termites

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	11	3	14
Water control	11	0	11
Totals	22	3	25

From this data we can predict expected frequencies

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	12.3	1.7	14
Water control	9.7	1.3	11
Totals	22	3	25

The  $\chi^2$  value is calculated below\*:

$$\chi^2 = \frac{(11-12.3)^2}{12.3} + \frac{(3-1.7)^2}{1.7} + \frac{(11-9.7)^2}{9.7} + \frac{(0-1.3)^2}{1.3}$$

\*Formula, table values, and computations can be found in Biometry, by Sokal and Rolf.

$$\chi^2 = 2.97, df=1$$

$\chi^2$  Table value= 7.9 at  $p=0.005$

Because the obtained value (2.97) is less than the table value (7.9), we can conclude that pepper extract is not significantly associated with drywood termite mortality.

Data for subterranean termites are shown below. Thirteen of 14 termites were dead after 24 hrs. when exposed to pepper extract. No termites in the water control died in this period. This result is statistically significant based on the following computations:

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	1	13	14
Water control	13	0	13
Totals	14	13	27

From this data we can predict expected frequencies

Observed frequencies	Alive (after 24 hrs.)	Dead (after 24 hrs)	Totals
Pepper extract	7.3	6.7	14
Water control	6.7	6.3	13
Totals	14	13	27

The  $\chi^2$  value is calculated below:

$$\chi^2 = \frac{(1-7.3)^2}{7.3} + \frac{(13-6.7)^2}{6.7} + \frac{(13-6.7)^2}{6.7} + \frac{(0-6.3)^2}{6.3}$$

$$\chi^2 = 19.9, df = 1$$

$\chi^2$  Table value = 7.9 at  $p = 0.005$

Because the obtained value (19.9) is greater than the table value (7.9), we can conclude that pepper extract is significantly associated with subterranean termite mortality. There is only a 0.5% probability that our results were due to chance alone.

### Conclusions:

Based on this experiment it is concluded that 'Habenero' pepper extract has the ability to kill subterranean termites under the following controlled laboratory conditions: direct contact with the pepper extract and continuous exposure to this extract for 24 hrs in a contained environment. Although drywood termite mortality was observed when exposed to pepper extract, the results were not statistically significant and inconclusive. It can not be stated with statistical confidence that pepper extract kills drywood termites.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Declarant:

\_\_\_\_\_  
Jeffrey Y. Honda, Ph.D.

Date: February 22, 1999

## CURRICULUM VITAE

### JEFFREY Y HONDA

3089 Teal Ridge Ct.  
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## EDUCATION

<b>University of California</b> <i>Ph.D. in Entomology</i>	<b>Riverside, CA</b> 1995
<b>University of California</b> <i>M.S. in Entomology</i>	<b>Riverside, CA</b> 1990
<b>San Jose State University</b> <i>B.S. in Biological Sciences</i> <i>Concentration Entomology</i>	<b>San Jose, CA</b> 1987

## PROFESSIONAL EMPLOYMENT

<b>San Jose State University</b> <i>Assistant Professor</i>	<b>San Jose, CA.</b> August 1998- Present
<b>Kyushu University</b> <i>Research Fellow</i>	<b>Fukuoka, Japan</b> June 1997-June 1998
<b>San Jose State University</b> <i>Assistant Professor</i> (Temporary Faculty Assignment)	<b>San Jose, CA</b> January 1996-May 1997 January 1997-May 1997
<b>Wageningen Agricultural University</b> <i>Research Associate</i>	<b>Wageningen, The Netherlands</b> August 1995-January 1996 July 1996-January 1997
<b>University of California</b> <i>Research Associate</i>	<b>Riverside, CA</b> February 1995- August 1995
<b>University of California</b> <i>Research and Teaching Assistant</i>	<b>Riverside, CA</b> September 1988-February 1995

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Page 2

**Moreno Valley Unified School District**  
*Substitute Teacher*

**Moreno Valley, CA**  
1992

**Santa Clara County Department of Food and Agriculture**  
*Inspector*

**San Jose, CA**  
1988

**Laboratory Services**  
*Assistant Laboratory Technician*

**San Jose, CA**  
1984 to 1988

**California Department of Food and Agriculture**  
*Inspector*

**Campbell, CA**  
1986

## PUBLICATIONS

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Page 3

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#### AWARDS AND FELLOWSHIPS

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FROM SJSU BIOLOGICAL SCI 4089244840

P. 5

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Jeffrey Y. Honda, Ph.D.  
February 19, 1999

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## Methods

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